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Radiance Measurements During Descent: Testing Retrieval Algorithms for Huygens on Venera 13/14

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If the optical properties throughout a planetary atmosphere and the boundary conditions - i.e. solar insolation at the top and surface albedo at the bottom - are known, the radiance inside the atmosphere can be modeled by radiative transfer computations. When analyzing radiance measurements from a descent probe, we have to solve the inverse problem to retrieve optical properties. On March 1 and March 5, 1982, Venera 13 and 14, respectively, reached the surface of Venus as the last, most developed probes of the Venera lander se- ries. During the descent, the spectrophotometer measured the radiance inside the atmosphere at different directions and wavelengths. In January 2005, the Descent Imager/Spectral Radiometer on board the Huygens probe will make similar observations - albeit at higher spatial and spectral resolution - during its descent through Titan's atmosphere. To retrieve the optical properties and the radiances, the Titan Inverse Radiation Model (TIRM) has been developed. As a test bed providing a consistency check, a modified version of TIRM is applied to Venera spectrophotometer data. The retrieved optical properties and the corresponding radiance field troughout Venus' atmosphere are presented.